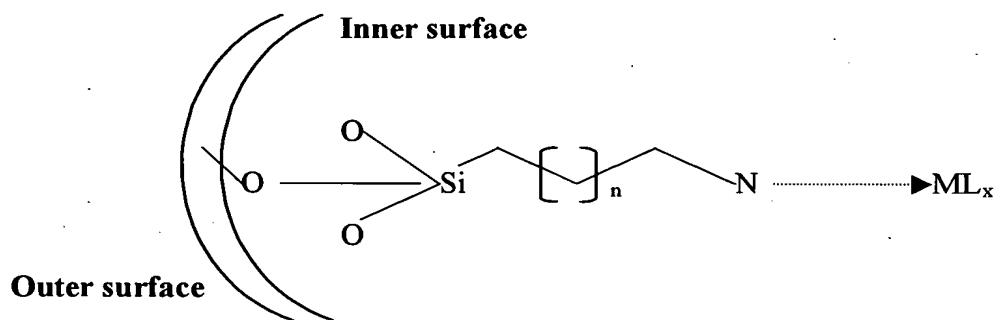


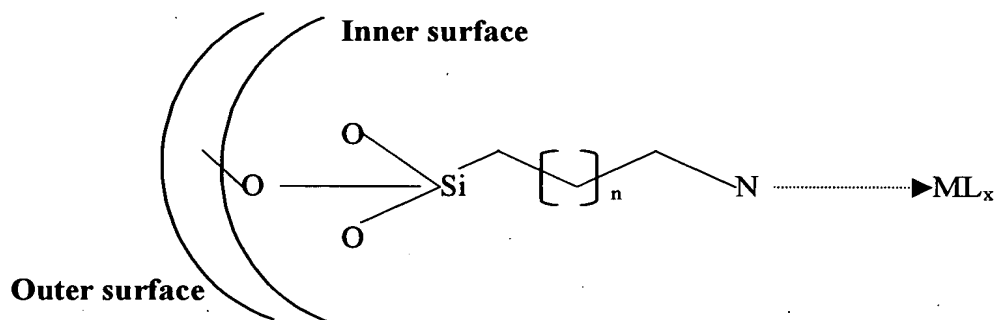
**We claim**

1. An immobilized metal complex catalyst of the Formula I

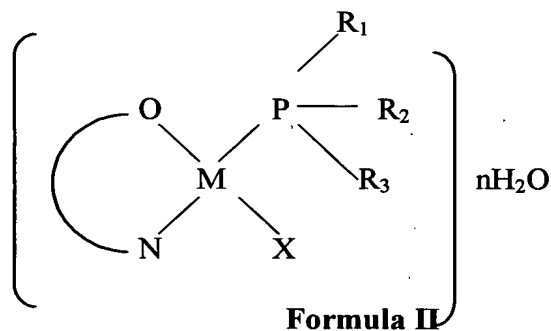


wherein M is a Group VIII metal, n is an integer with a value between 2 and 6,  $ML_x$  is an organometallic complex.

2. A process for the preparation of an immobilized metal complex catalyst of Formula I



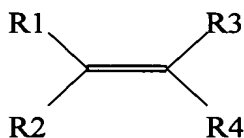
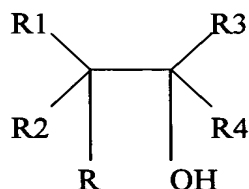
wherein M is a Group VIII metal, n is an integer with a value between 2 and 6,  $ML_x$  is an organometallic complex, the process comprising pretreating a solid matrix with an exterior surface and interior surface, by blocking the exterior surface using a blocking agent in a solvent system leaving the interior surface unperturbed, functionalising the interior surface of the solid matrix with a functionalized silane, followed by treating functionalized matrix with a transition metal complex solution of formula II



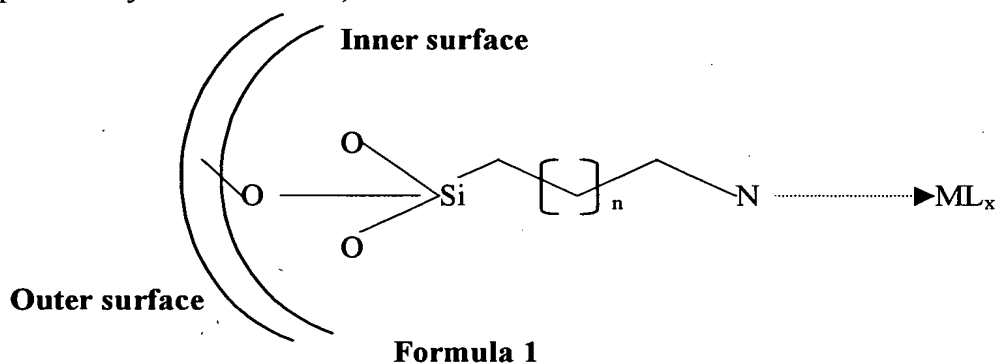
wherein M is a Group VIII metal; R1, R2, and R3 are substituents on the phosphine ligand and are selected from hydrogen, alkyl, aryl, arylalkyl, and arylalkyl

- cycloaromatic group; X is selected from the group consisting of aryl sulphonato, alkyl sulphonato, aryl carbonate, alkyl carbonate, formate, and a halide selected from the group consisting of Cl, Br, I; N-O is a semilabile anionic chelating ligand containing a N-donor and O group;  $1 < n < 10$ ; to actually anchor the complex to the interior of the solid matrix, to obtain the immobilized metal complex catalyst.
3. A process as claimed in claim 2 wherein the solid matrix comprises a microporous or meoporous material selected from Zeolite Y, Zeolite B, ZSM-5 etc. (microporous), and MCM-41, MCM-48 (mesoporous) respectively.
  4. A process as claimed in claim 2 wherein the solid matrix is purely siliceous or is aluminated (containing aluminium in the matrix framework).
  5. A process as claimed in claim 2 wherein the blocking agent used for the blocking of the exterior surface is selected from the group consisting of a dialkyl and a diaryl substituted dihalosilane having the general formula of  $R_2SiXI_2$ , where R is any alkyl, aryl, arylalkyl group etc., and X is a halogen atom selected from Cl, Br, and I.
  6. A process as claimed in claim 2 wherein the solvent system used for the treatment of the matrix to block the exterior surfaces and subsequent functionalization is selected from the group consisting of dichloromethane, diethylether, dry methonal, dry ethanol, cyclohexane, cyclopentane, hexane, pentane and octane.
  7. A process as claimed in claim 2 wherein the functionalizing agent used for anchoring the transition metal complexe to the pretreated matrices is a functionalized - alkyl-substituted ( $Z-[CH_2]_n-$ ) silane containing at least one alkoxy group (-OR) attached to the silicon atom, having a general formula of  $Z-(CH_2)_n - Si(OR)_mH_{3-m}$  wherein Z is a functional group selected from the group consisting of-  $NH_2$ , -SH, vinyl and allyl, "n" is an integer between 2 and 6, m is an integer between 1 and 3.
  8. A process as claimed in claim 2 wherein in the transition metal complex of Formula II above N-O is a semilabile anionic chelating ligand containing a N-donor and O group selected from the group consisting of 8-hydroxyquinoline, 2-hydroxypyridine, 2-(2-hydroxyethyl) pyridyl-2-, piperidyl-2-, quinoly -2-, isoquinoly-1-, and isoquinolyl-3-carboxylates and  $1 < n < 10$ .
  9. A process as claimed in claim 8 wherein the semilabile anionic chelating ligand is pyridyl-2-carboxylate.
  10. A process as claimed in claim 2 wherein in formula II, M is Pd; R1, R2, R3, are phenyl; X is *p*-toluenesulphonato ( $OTs^-$ ), N-O is pyridyl - 2-carboxylate and n is 3.

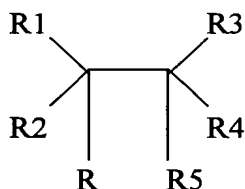
11. A process as claimed in claim 2 wherein the anchoring of the metal complexes of the general formula II is done in a solvent selected from methanol, ethanol, Propanol, acetone and 2-butanone.
12. A process for the carbonylation of an aryl olefin or an alcohol of formula III and IV respectively,

**Formula III****Formula IV**

wherein R1, R2, R3, R4 and R are independently selected from the group consisting of hydrogen, alkyl, aryl, arylalkyl and arylalkyl cycloaromatic group with or without substituents; which comprises reacting the aryl olefin or alcohol with carbon monoxide (CO) and water (H<sub>2</sub>O) as reagents, in the presence of an immobilized metal complex catalyst of Formula I,

**Formula 1**

wherein M is a Group VIII metal, n is an integer with a value between 2 and 6, ML<sub>x</sub> is an organometallic complex, and in the presence of a promoter selected from an alkali metal halide, and a proton source, in an organic solvent, heating the reaction mixture to a temperature between 30 to 120°C, for a period of 8 hours to 24 hours at a pressure ranging from 1 to 60 atm, cooling the reaction mixture thereafter to ambient temperature, flushing the mixture with inert gas, removing the catalyst by filtration, removing the solvent and isolating a product comprising an isomeric saturated carboxylic acid of Formula V

**Formula V**

wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> are independently selected from the group consisting of hydrogen, alkyl, aryl, arylalkyl and arylalkyl cycloaromatic group with or without substituents; R is H or a carboxylic acid group –COOH and R<sub>5</sub> is H or a carboxylic acid group –COOH, provided that when R is H, R<sub>5</sub> is –COOH and when R is –COOH, R<sub>5</sub> is H; in a chemo-selective and regioselective manner.

13. A process as claimed in claim 12 wherein the proton source is selected from water, a Bronsted acid selected from the group consisting of formic acid, acetic acid, oxalic acid, a hydrohalic acid selected from the group consisting of hydrochloric acid, hydrobromic acid and hydroiodic acid, a protonic acid selected from the group consisting of para-toluenesulphonic acid, methane sulphonic acid, trifluoromethanesulphonic acid, and trifluoroacetic acid.
14. A process as claimed in claim 12 wherein the organic solvent used in the carbonylation reaction is an aprotic solvent selected from an aromatic hydrocarbons selected from the group consisting of benzene, toluene and xylene; a ketone selected from the group consisting of methyl ethyl ketone and acetone; an amide comprising N-methyl pyrrolidone; a cycle ether selected from tetrahydrofuran and dioxan, a nitrile comprising acetonitrile.
15. A process as claimed in claim 12 wherein the promoter used is an alkali metal promoter selected from the group consisting of an alkali metal halide of the formula M'X, wherein M' is a metal selected from the group consisting of Lithium, Sodium and Potassium and X is a halide selected from the group consisting of chloride, bromide and iodide.
16. A process as claimed in claim 12 wherein the reaction is carried out in the presence of a phosphorous ligand.
17. A process as claimed in claim 16 wherein the phosphorous ligand used in the preparation of complex of formula II as well as in the carbonylation is a mono-phosphine selected from the group consisting of triphenyl phosphine, tris-paratolyl phosphine, trisparachlorophenyl phosphine, tris-paramethoxy phenyl phosphine, tricyclohexyl phosphine, tributyl phosphine and methyldiphenyl phosphine.
18. A process as claimed in claim 12 wherein the concentration of the Group VIII, metal in the immobilized metal complex catalyst is 1 mole for 1000 to 8000 moles of the substrate, preferably 5600.

19. A process as claimed in claim 12 wherein the number of moles of the acid promoter per gram atom of Group VIII metal in the catalyst system is in the range of 10 to 1000, preferably 580.
20. A process as claimed in claim 12 wherein the number of moles of the alkali metal promoter per gram atom of palladium in the catalyst system is in the range of 10 to 1000, preferably 580.
21. A process as claimed in claim 12 wherein the number of moles of the blocking agent for blocking the exterior surface of the porous matrix for one gram of the support is in the range of 0.1 to 1 mmoles, preferable 0.142 mmols.
22. A process as claimed in claim 12 wherein the amount of the anchoring agent used to anchor the metal complexes to the pretreated support materials is in the range of 1 to 10 mmoles preferentially 5.73 mmols.
23. A process as claimed in claim 12 wherein the carbonization reaction is carried out in a stirred reactor with catalyst employed being employed as a heterogeneous phase with a suitable solvent in presence of halide and acid promoters, and carbon monoxide.